Claims

1. A method of enhancing migration of CaR receptor expressing cells to a specific site in a subject, comprising:

locally administering to a specific site in a subject in need of such treatment a nonCa^{++} CaR receptor agonist in an amount effective to enhance migration of CaR receptor expressing cells to the specific site in the subject.

2. The method of claim 1, wherein the CaR receptor expressing cells are hematopoietic cells.

3. The method of claim 2, wherein the hematopoietic cells are hematopoietic progenitor cells.

4. The method of claim 1, wherein the CaR receptor expressing cells are neural cells.

5. The method of claim 1, wherein the CaR receptor expressing cells are epithelial cells.

6. The method of claim 1, wherein the CaR receptor expressing cells are mesenchymal cells.

7. The method of claim 1, wherein the CaR receptor expressing cells are endothelial cells.

8. The method of claim 1, wherein the nonCa^{++} CaR receptor agonist is NPS R-467.

9. The method of claim 1, wherein the nonCa^{++} CaR receptor agonist is NPS S-467.

10. A method of inhibiting migration of CaR receptor expressing cells to a specific site in a subject, comprising:

locally administering to a specific site in a subject in need of such treatment a CaR receptor antagonist in an amount effective to inhibit migration of CaR receptor expressing cells to the specific site in the subject.

11. The method of claim 10, wherein the specific site is a site of inflammation.

12. The method of claim 11, further comprising co-administering a non-CaR receptor antagonist that inhibits migration of immune cells to the site of inflammation in the subject.

13. The method of claim 12, wherein the non-CaR receptor antagonist is an antiinflammatory agent.

14. The method of claim 10, wherein the subject has an autoimmune disease.

15. The method of claim 14, wherein the autoimmune disease is rheumatoid arthritis, uveitis, insulin-dependent diabetes mellitus, hemolytic anemias, rheumatic fever, Crohn's disease, Guillain-Barre syndrome, psoriasis, thyroiditis, Graves' disease, myasthenia gravis, glomerulonephritis, autoimmune hepatitis, or systemic lupus erythematosus.

16. The method of claim 10, wherein the subject has an abscess, a transplant, an implant, atherosclerosis, or myocarditis.

17. The method of claim 10, wherein the CaR receptor expressing cells are hematopoietic cells.

18. The method of claim 17, wherein the hematopoietic cells are hematopoietic progenitor cells.

19. The method of claim 10, wherein the CaR receptor expressing cells are neural cells.

20. The method of claim 10, wherein the CaR receptor expressing cells are epithelial cells.

21. The method of claim 10, wherein the CaR receptor expressing cells are mesenchymal cells.

22. The method of claim 10, wherein the CaR receptor expressing cells are endothelial cells.

23. The method according to any of claims 10-22, wherein the CaR receptor antagonist is NPS-2143.

24. A method of repelling CaR receptor expressing cells from a material surface, comprising:

coating a material surface with an amount of a CaR receptor antagonist effective to repel CaR receptor expressing cells from the material surface.

25. The method of claim 24, wherein the material surface is part of an implant.

26. The method of claim 24, wherein the CaR receptor antagonist is NPS-2143.

27. A method of attracting CaR receptor expressing cells to a material surface, comprising:

coating a material surface with a nonCa^{++} CaR receptor agonist in an effective amount to attract CaR receptor expressing cells to the material surface.

28. The method of claim 27, wherein the CaR receptor expressing cells are hematopoietic cells.

29. The method of claim 27, wherein the hematopoietic cells are hematopoietic progenitor cells.

30. The method of claim 27, wherein the CaR receptor expressing cells are neural cells.

31. The method of claim 27, wherein the CaR receptor expressing cells are epithelial cells.

32. The method of claim 27, wherein the CaR receptor expressing cells are mesenchymal cells.

33. The method of claim 27, wherein the CaR receptor expressing cells are endothelial cells.

34. The method of claim 27, wherein the nonCa^{++} CaR receptor agonist is NPS R-467.

35. The method of claim 27, wherein the nonCa^{++} CaR receptor agonist is NPS S-467.

36. A method of enhancing an immune response in a subject having a condition that involves a specific site, comprising:

locally administering to the specific site in a subject in need of such treatment a nonCa^{++} CaR receptor agonist, in an amount effective to enhance immune cell migration to the specific site in the subject.

37. The method of claim 36, wherein the specific site is a site of a pathogenic infection.

38. The method of claim 36, wherein the specific site is a germ cell-containing site.

39. The method of claim 36, wherein the specific site is an area immediately surrounding a tumor.

40. A method for enhancing migration of a cell toward a chemokine, comprising:

contacting a cell known to migrate toward a chemokine that is not a CaR receptor agonist with the chemokine and a CaR receptor agonist in a combined amount effective to enhance migration of the cell toward the chemokine, wherein the amount of CaR receptor agonist is effective to potentiate the amount of chemokine versus the same amount of the chemokine if administered without the CaR receptor agonist.

41. The method of claim 40, wherein the CaR receptor agonist is Ca^{++}.

42. The method of claim 40, wherein the CaR receptor agonist is NPS R-467.

43. The method of claim 40, wherein the CaR receptor agonist is NPS S-467.

44. The method of claim 40, wherein the chemokine is selected from the group consisting of MCP-1, MIP-1β, and SDF-1.

45. A method for enhancing expression of a chemokine receptor in a cell, comprising:

contacting a cell expressing a chemokine receptor with a CaR receptor agonist in an effective amount to enhance expression of the chemokine receptor in the cell.

46. The method of claim 45, wherein the CaR receptor agonist is Ca^{++}.

47. The method of claim 45, wherein the CaR receptor agonist is NPS R-467.

48. The method of claim 45, wherein the cell expressing a chemokine receptor is a hematopoietic cell.

49. The method of claim 45, wherein the chemokine receptor is selected from the group consisting of CCR-2, CCR-5, and CXCR-4.

50. A method for enhancing bone marrow engraftment following bone marrow transplantation, comprising:

contacting isolated bone marrow cells to be transplanted with a CaR receptor agonist in an effective amount to increase chemokine receptor expression in the isolated bone marrow cells to enhance bone marrow engraftment following bone marrow transplantation of said cells.

51. The method of claim 50, wherein the CaR receptor agonist is Ca^{++}.

52. The method of claim 50, wherein the CaR receptor agonist is NPS R-467.

53. The method of claim 50, wherein the isolated bone marrow cells are hematopoietic progenitor cells.

54. The method of claim 50, wherein the chemokine receptor is the selected from the group consisting of CCR-2, CCR-5, and CXCR-4.

55. A method for enhancing mobilization of hematopoietic cells in a subject, comprising:

administering to subject in need of such treatment a CaR receptor antagonist in an amount effective to enhance mobilization of hematopoietic cells in the subject.

56. The method of claim 55, wherein the CaR receptor antagonist is NPS-2143.

57. The method of claim 55, wherein the hematopoietic cells are hematopoietic progenitor cells.

58. The method of claim 55, wherein the hematopoietic cells are hematopoietic stem cells.

59. The method of claim 55, wherein the subject is a bone marrow donor.

60. A method for treating a subject to enhance immune reactivity to a specific antigen in the subject, comprising:

administering to a subject in need of such treatment an amount of a CaR receptor agonist together with an amount of a specific antigen, wherein the amount of the CaR receptor agonist is sufficient to enhance in the subject immune reactivity to the specific antigen versus the same amount of the specific antigen if administered without the a CaR receptor agonist.

61. The method of claim 60, wherein the CaR receptor agonist is Ca^{++}.

62. The method of claim 60, wherein the CaR receptor agonist is NPS R-467.

63. The method of claim 60, further comprising co-administering a non-CaR receptor agonist adjuvant.

64. The method of claim 63, wherein the non-CaR receptor agonist adjuvant is Freund's incomplete adjuvant.

65. A method for treating a subject to enhance immune tolerance in the subject, comprising:

administering to a subject in need of such treatment an amount of a CaR receptor antagonist, wherein the amount of the CaR receptor antagonist is sufficient to enhance in the subject immune tolerance to self or a non-self antigen.

66. The method of claim 65, wherein the CaR receptor antagonist is NPS-2143.

67. The method of claim 65, wherein the subject has an autoimmune disease.

68. The method of claim 67, wherein the autoimmune disease is rheumatoid arthritis, uveitis, insulin-dependent diabetes mellitus, hemolytic anemias, rheumatic fever, Crohn's disease, Guillain-Barre syndrome, psoriasis, thyroiditis, Graves' disease, myasthenia gravis, glomerulonephritis, autoimmune hepatitis, or systemic lupus erythematosus.

69. The method of claim 65, wherein the subject has an abscess, a transplant, an implant, atherosclerosis, or myocarditis.

70. A method for enhancing bone marrow engraftment following bone marrow transplantation, comprising:

contacting isolated bone marrow cells to be transplanted with an agent that increases CaR receptor expression in an effective amount to increase CaR receptor expression in the isolated bone marrow cells to enhance bone marrow engraftment following bone marrow transplantation of said cells.

71. The method of claim 70, wherein the agent that increases CaR receptor expression is Ca^{++}.

72. The method of claim 70, wherein the agent that increases CaR receptor expression is Vitamin D.

73. The method of claim 70, wherein the agent that increases CaR receptor expression is a chemokine.

74. The method of claim 73, wherein the chemokine is IL-1β.

75. The method of claim 70, wherein the agent that increases CaR receptor expression is a CaR receptor agonist.

76. The method of claim 70, wherein the isolated bone marrow cells are hematopoietic progenitor cells.

77. A method for modulating hematopoietic progenitor cell function, comprising:

contacting a hematopoietic progenitor cell with an agent that modulates CaR receptor expression in an effective amount to modulate CaR receptor expression in the hematopoietic progenitor cell to modulate its function.

78. The method of claim 77, wherein the agent that modulates CaR receptor expression is selected from the group consisting of Ca^{++}, Vitamin D, a chemokine, a CaR receptor agonist, a CaR receptor antagonist, a CaR receptor antisense agent, and a CaR receptor nucleic acid.

79. A method for inducing hematopoietic progenitor cell quiescence, comprising:

contacting a hematopoietic progenitor cell with an agent that increases CaR receptor expression in an effective amount to increase CaR receptor expression in the hematopoietic progenitor cell to induce quiescence of the hematopoietic progenitor cell.

80. The method of claim 79, wherein the contacting occurs *in vitro*.

81. A method for inhibiting hematopoietic progenitor cell-death, comprising:

inducing hematopoietic progenitor cell quiescence according to claim 79 to inhibit hematopoietic progenitor cell-death.

82. The method of claim 81, wherein the hematopoietic progenitor cell is under environmental stress.

83. A method for inducing hematopoietic progenitor cell differentiation, comprising:

contacting a hematopoietic progenitor cell with an agent that decreases CaR receptor expression in an effective amount to decrease CaR receptor expression in the hematopoietic progenitor cell to induce differentiation of the hematopoietic progenitor cell.

84. The method of claim 83, wherein the contacting occurs *in vitro*.